Stoller
Hanford Office

DOE-EM/GJ1066-2005

299-E24-54 (A5911)
Log Data Report (Event 2)

Borehole Information:

Borehole: 299-E24-54 (A5911)			Site: 216-A-4 Crib		
Coordinates (WA St Plane)		GWL[1] (ft) : None		GWL Date: 04/07/05	
North (m)	East (m)	Drill Date	Ground Level Elevation (ft)	Total Depth (ft)	Type
135536.193	575224.407	01/55	716.0	102	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded Steel	2.05	6 5/8	6 1/8	1/4	2.05	102
Welded Steel	0	8 5/8	8	unknown	0	50

Borehole Notes:

This Log Data Report presents data acquired in October 2005 and is referred to as Event 2. This borehole was initially logged during April 2005. The purpose of Event 2 data acquisition is to compare log data for the possible detection of changes since April. Additionally, moisture measurements were acquired during Event 2.

The logging engineer measured the 6-in. casing and stick up using a steel tape. Measurements were rounded to the nearest 1/16 in. The 8-in. casing was not visible at the ground surface. Casing depths are derived from HWIS[2], which reports the borehole was originally drilled in 1955 to a depth of 50 ft. In 1982, the borehole was deepened to 102 ft with a 6-in. casing placed to total depth. The annulus between the 6-in. and 8-in. casings was grouted from 0 to 50 ft. The bottom 2 ft (100-102 ft) of the borehole was plugged with grout.

Logging Equipment Information:

Logging System:	Gamma 1E		Type:	SGLS (70%) SN: 34TP40587A
Calibration Date:	04/05	Calibration Reference:	DOE-EM/GJ865-2005	
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0	

Neutron Moisture Logging System (NMLS) Equipment Information:

Logging System:	Gamma 4F		Type:	SN: H380932510
Effective Calibration Date:	10/24/05	Calibration Reference:	DOE/EM-GJ1020-2005	
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat			
Date	10/13/05	10/13/05			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	99.5	50.5			
Finish Depth (ft)	2.5	39.5			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
ft/min	N/A[3]	N/A			
Pre-Verification	AE127CAB	AE127CAB			
Start File	AE127000	AE127098			
Finish File	AE127097	AE127109			
Post-Verification	None	None			
Depth Return Error (in.)	- 1	- 1			
Comments	No fine gain adjustment.	No fine gain adjustment.			

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	3	4 Repeat			
Date	10/20/05	10/20/05			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	2.0	60.5			
Finish Depth (ft)	98.25	75.5			
Count Time (sec)	N/A	N/A			
Live/Real	R	R			
Shield (Y/N)	N	N			
Sample Interval (ft)	0.25	0.25			
ft/min	1.0	1.0			
Pre-Verification	DF052CAB	DF052CAB			
Start File	DF082000	DF052386			
Finish File	DF052385	DF052446			
Post-Verification	DF052CAA	DF082CAA			
Depth Return Error (in.)	N/A	- 1			
Comments	None	None			

Logging Operation Notes:

Logging was conducted with a centralizer on the sondes. Logging data acquisition is referenced to the top of casing. Repeat sections were collected in this borehole to evaluate system performance.

Analysis Notes:

Analyst:	Henwood	Date:	12/12/05	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre-run and post-run verifications for the logging system were performed before and after each day's data acquisition. The acceptance criteria were met.

A combined casing correction for 0.572-in.-thick casing was applied to the log data between the ground surface and 50 ft. Below 50 ft a correction for 0.322-in.-thick casing was applied.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with an EXCEL worksheet template identified as G1Eapr05.xls using efficiency functions and corrections for casing, water, and dead time as determined from annual calibrations.

The neutron moisture data were corrected for a 6-in. inside diameter casing.

Results and Interpretations:

^{137}Cs and ^{60}Co were the man-made radionuclides detected in this borehole. ^{137}Cs was detected in two primary depth intervals between approximately 29 and 36 ft and between 64 and 91 ft. ^{137}Cs was also detected at approximately 1 pCi/g and below at a few other locations in the borehole. The maximum concentration was measured at approximately 55 pCi/g at 65.5 ft.

^{60}Co was detected between 29 and 54 ft and between 65 and 69 ft. The maximum concentration was measured at 2 pCi/g at 45.5 ft.

The comparison of SGLS data acquired in April and October 2005 indicates good agreement and suggests no detectable change in contaminant profile has occurred over approximately 6 months.

Moisture measurements are influenced by the double casing and grout from the ground surface to approximately 50 ft. The calibration for percent moisture is invalid for this interval. Below 50 ft, the percent moisture probably reflects the moisture content accurately if the assumed well configuration (6-in. casing with no grout) is correct. A relatively high moisture interval is indicated between 53 and 57 ft.

The repeat sections generally indicate good agreement of the naturally occurring KUT, man-made radionuclides, and moisture.

List of Plots:

Man-Made Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma and Dead Time
Total Gamma and Moisture
Comparison of Man-Made Radionuclides
Total Gamma Comparison and Moisture
Repeat Section of Man-Made Radionuclides
Repeat Section of Natural Gamma Logs
Moisture Repeat Section

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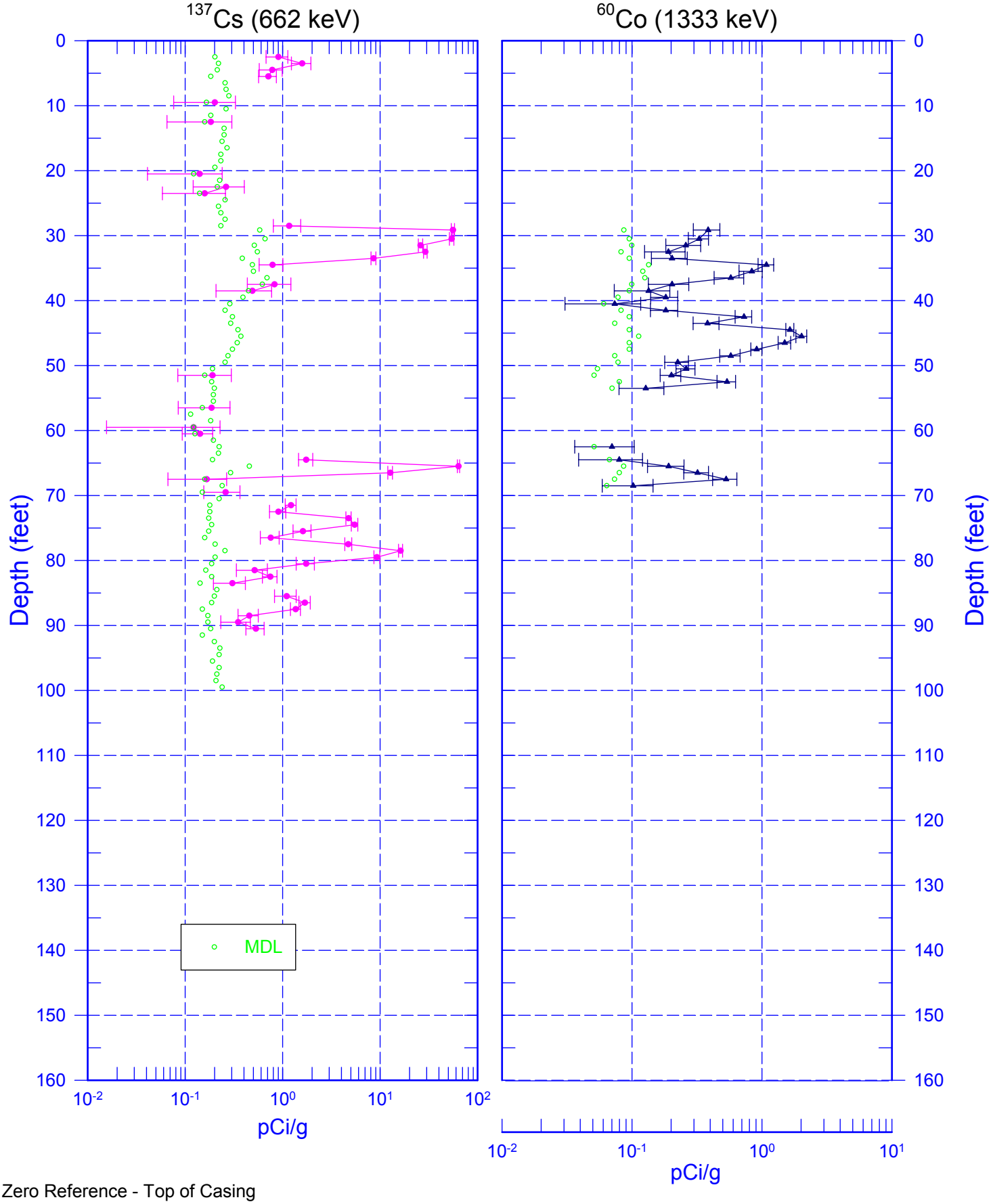
[1] GWL – groundwater level
[2] HWIS – Hanford Wells Information System
[3] N/A – not applicable

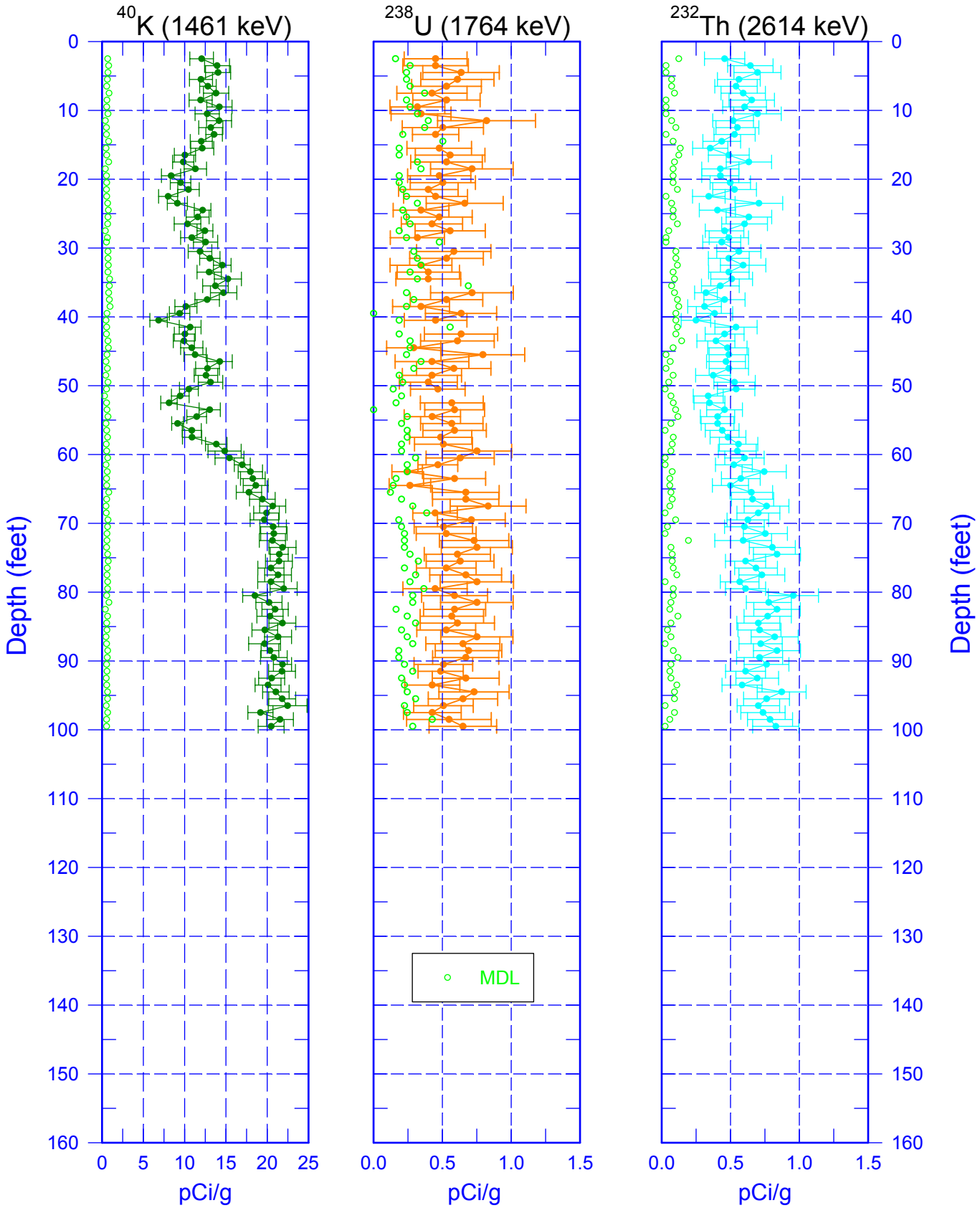
299-E24-54 (A5911) Event 2

Man-Made Radionuclides



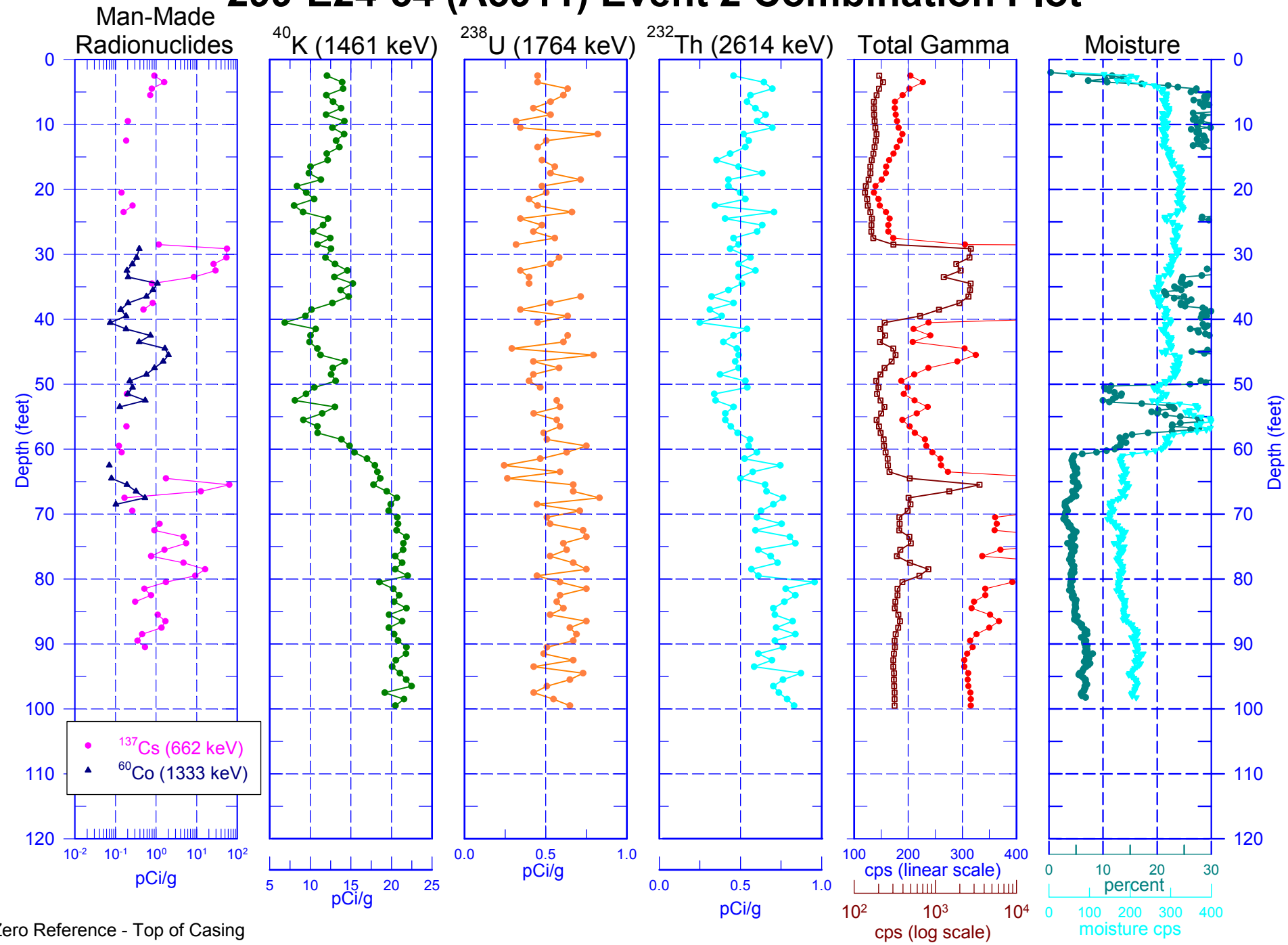
Zero Reference - Top of Casing

299-E24-54 (A5911) Event 2
Natural Gamma Logs



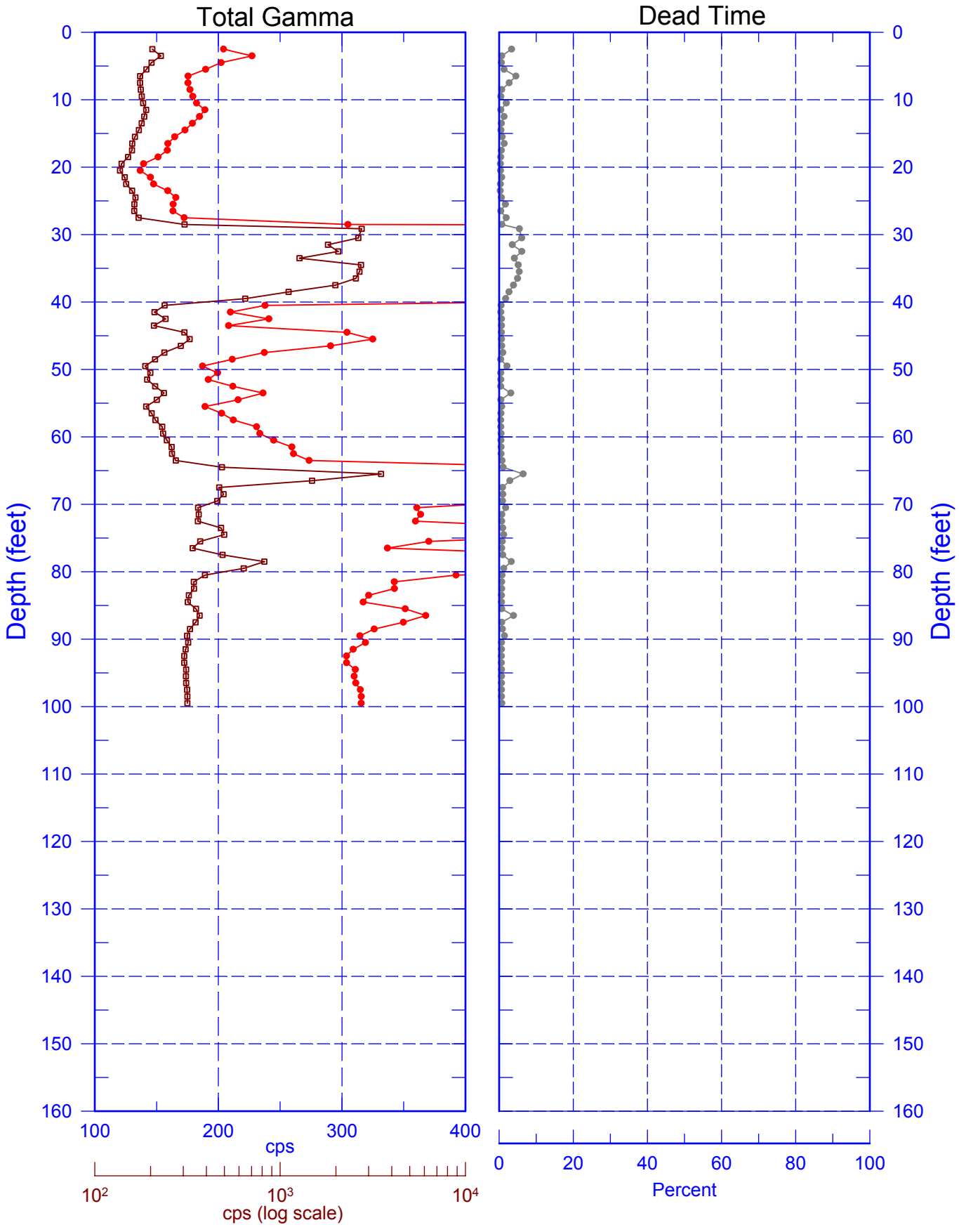
Zero Reference = Top of Casing

299-E24-54 (A5911) Event 2 Combination Plot



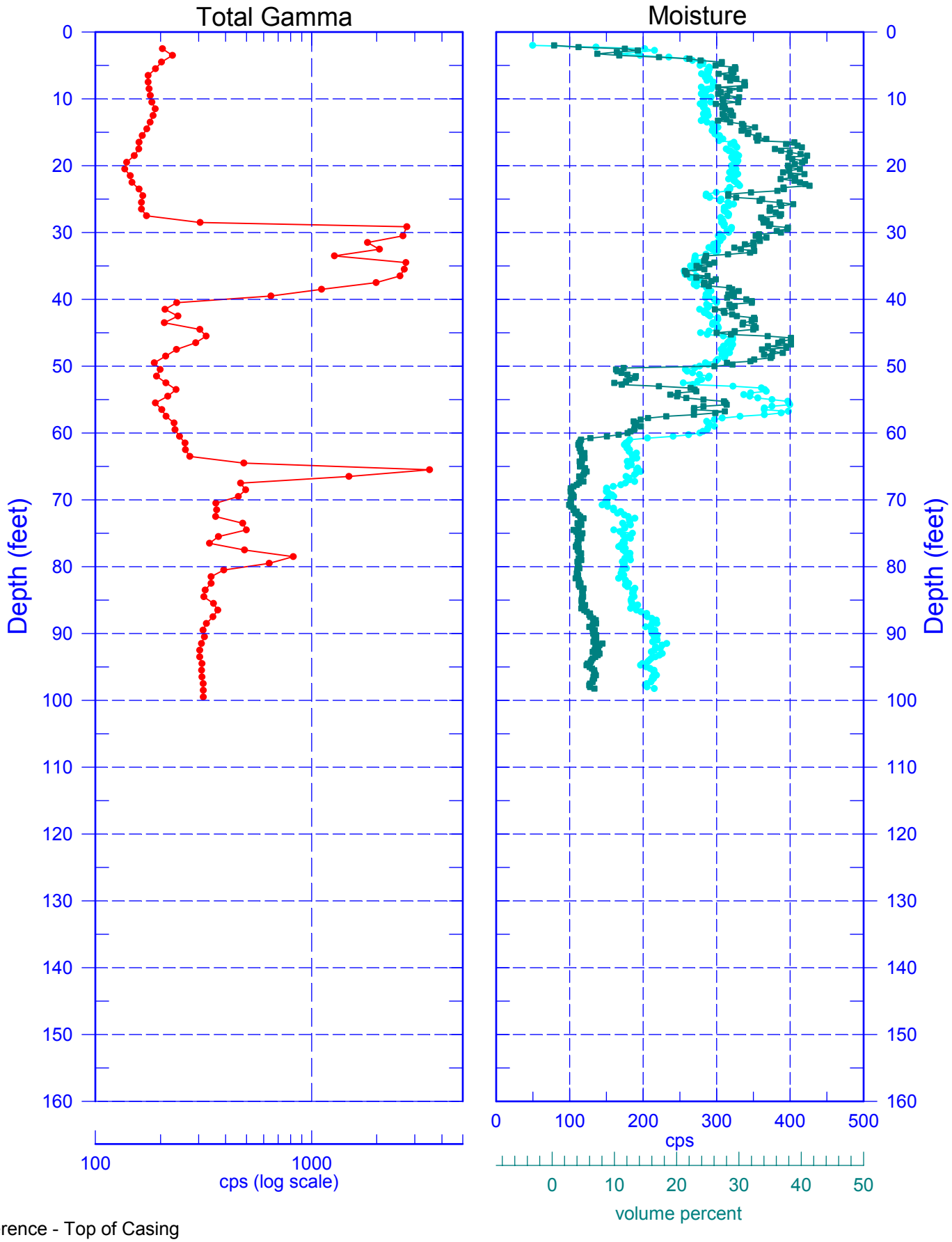
Zero Reference - Top of Casing

299-E24-54 (A5911) Event 2
Total Gamma & Dead Time



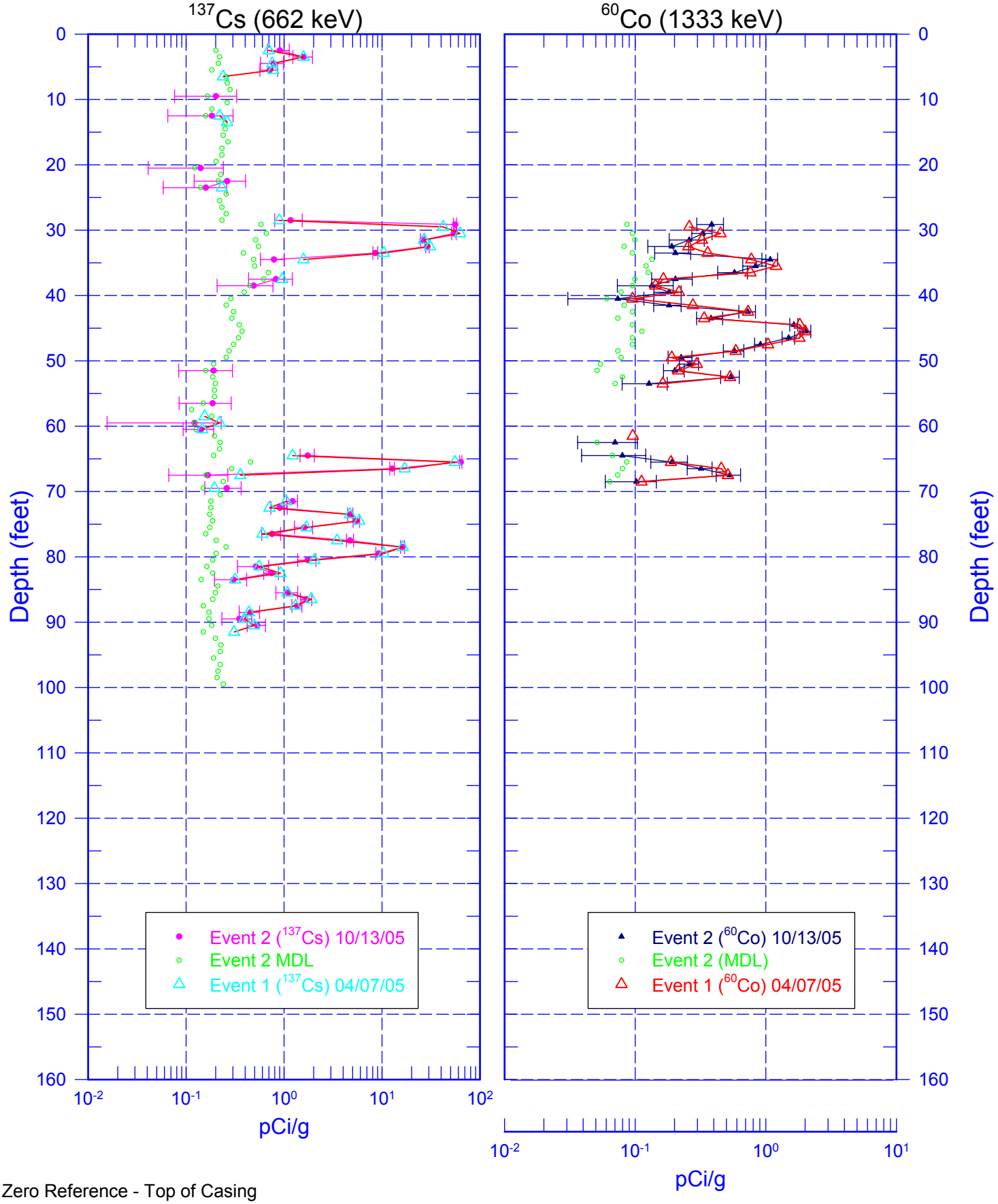
Reference - Top of Casing

299-E24-54 (A5911) Event 2
Total Gamma & Moisture



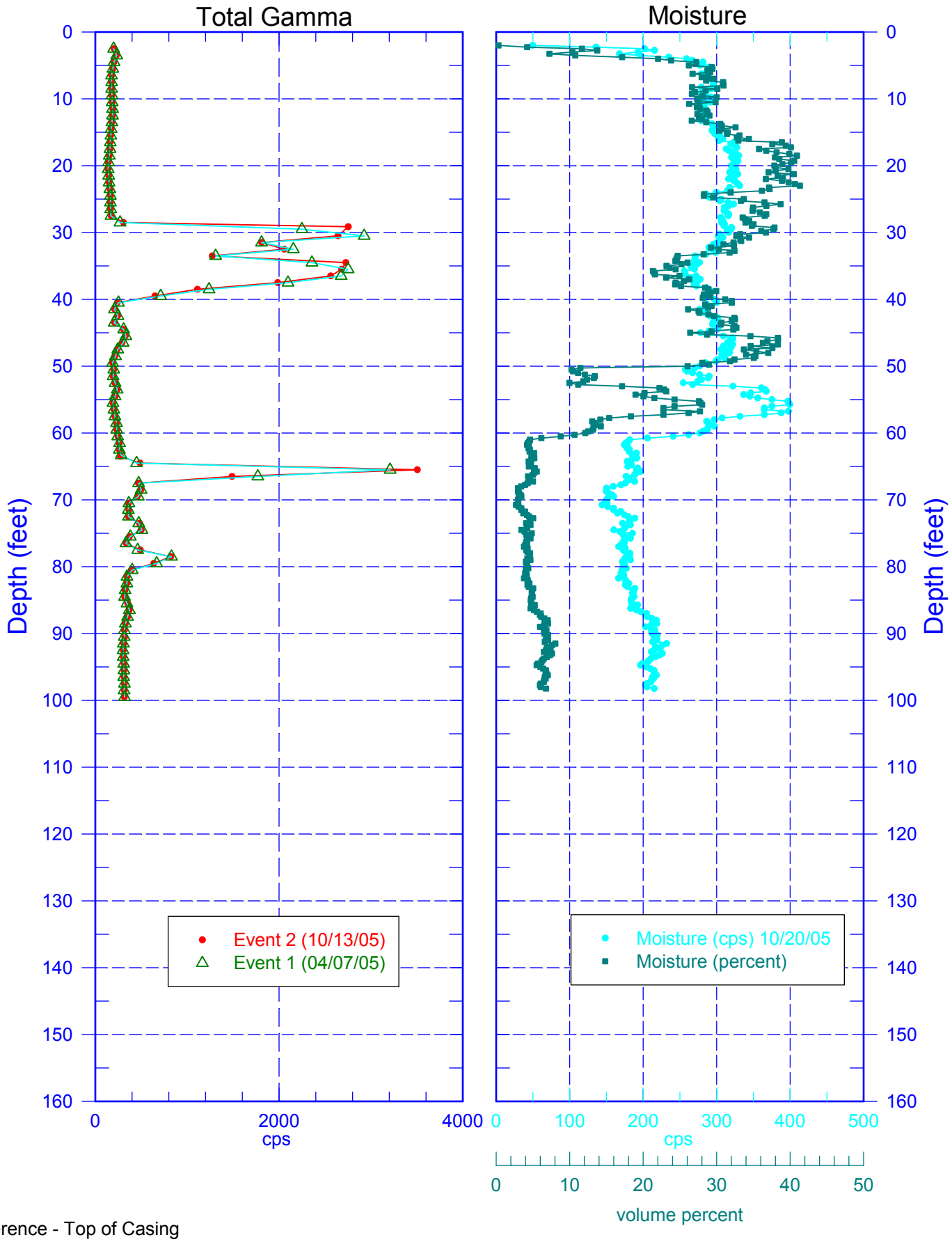
Reference - Top of Casing

299-E24-54 (A5911)
Comparison of Man-Made Radionuclides



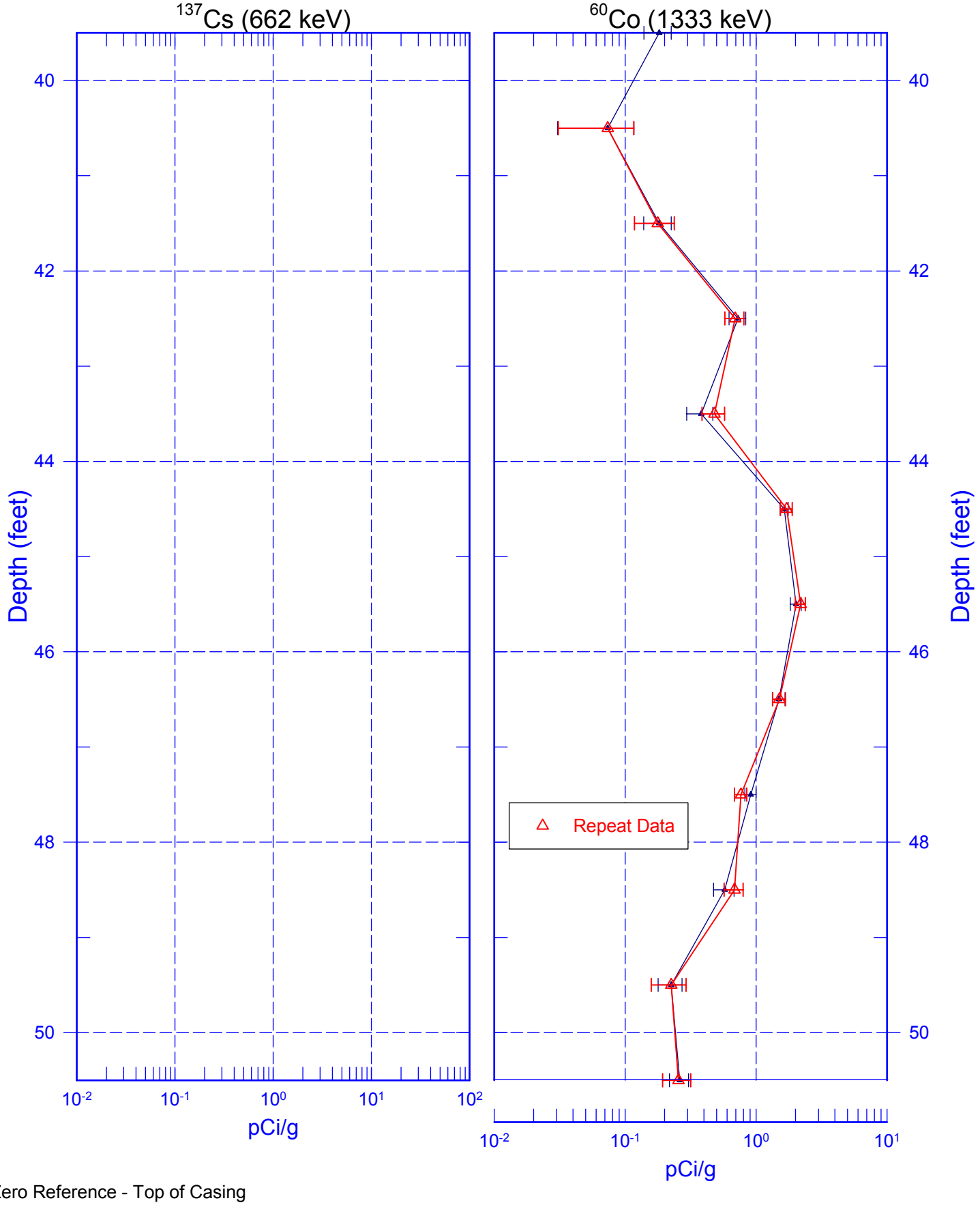
Zero Reference - Top of Casing

299-E24-54 (A5911)
Total Gamma Comparison & Moisture



Reference - Top of Casing

299-E24-54 (A5911) Event 2
Repeat Section of Man-Made Radionuclides



Zero Reference - Top of Casing

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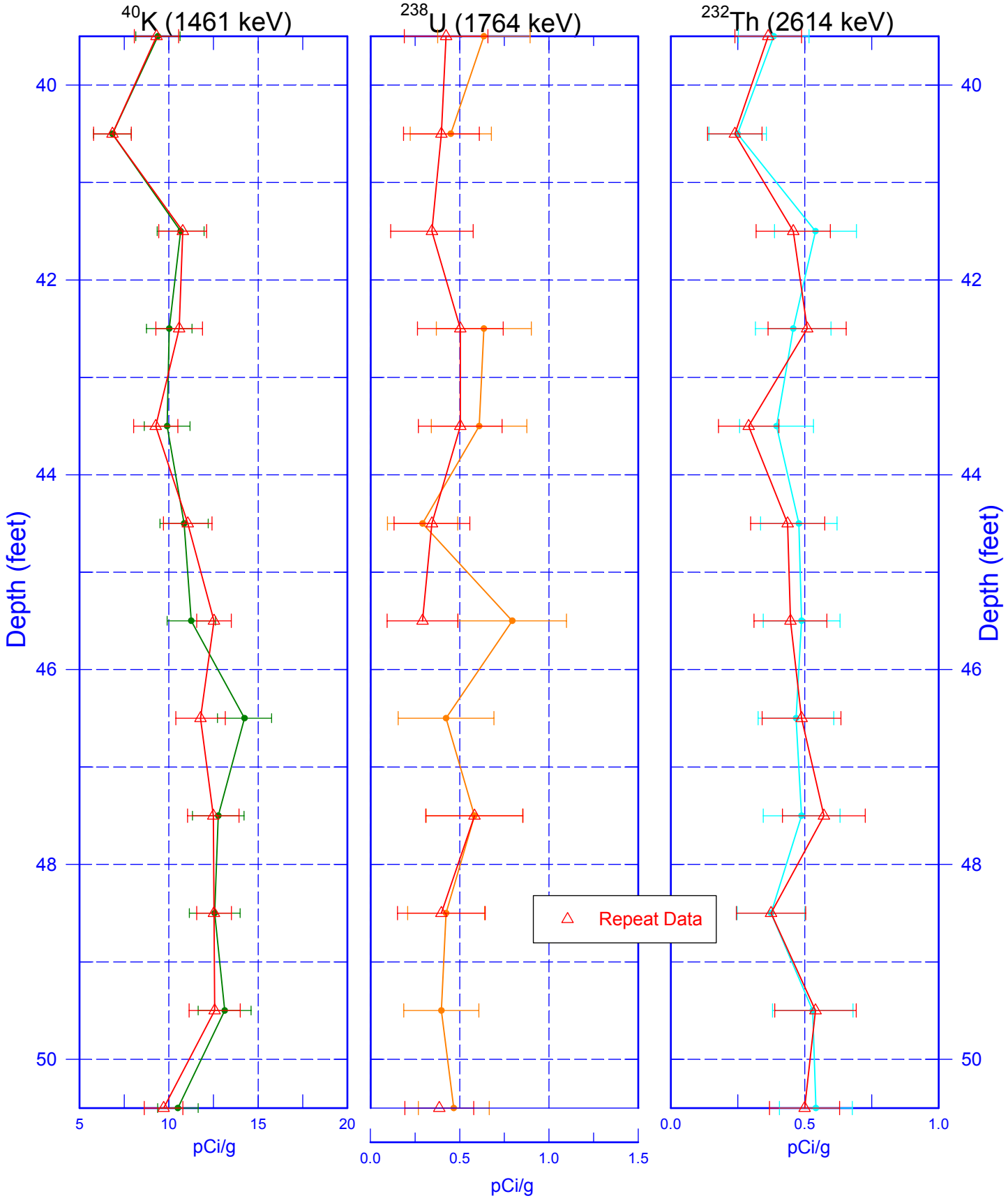
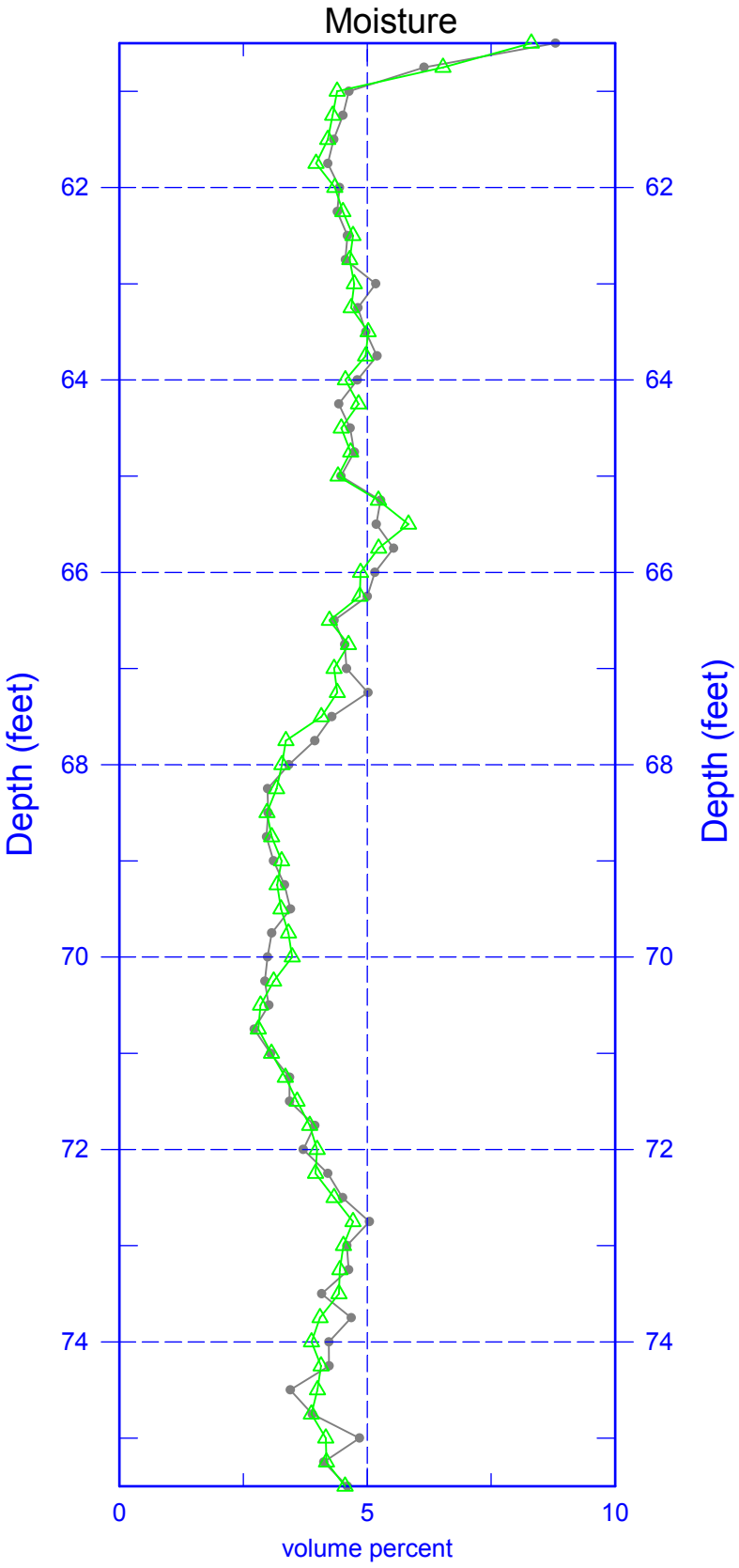
Repeat Section of Natural Gamma Logs



Zero Reference - Top of Casing

299-E24-54 (A5911) Event 2
Moisture Repeat Section



Reference - Top of Casing